

Amendments to the specification:

On page 1, after the title, please insert the following new paragraph:

CROSS-REFERENCE

The invention described and claimed hereinbelow is also described in PCT/EP 2005/052660, filed on June 9, 2005 and DE 102004031626.0, filed June 30, 2004. This German Patent Application, whose subject matter is incorporated here by reference, provides the basis for a claim of priority of invention under 35 U.S.C. 119 (a)-(d).

On page 4, please amend the last paragraph as follows:

Further advantages of the inventive method and the inventive device are illustrated in the drawings drawing, below, and in the associated description of advantageous embodiments.

On page 5, please amend the first paragraph as follows:

The drawings depict ~~drawing depicts~~ embodiments of the inventive method and the inventive device system for determining the thickness of material by penetrating the material; they are explained in greater detail in the subsequent description. The figures in the drawings drawing, their description and the claims contain numerous features in combination. One skilled in the art will also consider these features individually and combine them to form further reasonable combinations, which are therefore also disclosed in the description.

Please amend the paragraph bridging pages 5-6 as follows:

With the aid of a high-frequency measuring device 12, which is operated as a pulse reflectometer and is placed on a surface 14 of workpiece 10 to be investigated, a measurement signal in the gigahertz frequency range is transmitted through material 10 to be investigated and is returned – to a receiving unit of high-frequency measuring device 12 in a manner to be described below – via a transponder 18 located on surface 16 of the material to be investigated opposite from high-frequency measuring device 12. The path covered and, therefore, the thickness of the material, can be deduced from the transit time of the measurement signal. To do this, the propagation ~~propagation~~ speed of the measurement signal in the material must be known. This, in turn, depends on the material properties and, in particular, on the dielectric constants of the material.

Please amend the first full paragraph on page 7 as follows:

Reflector means 18 sends a return measurement signal 28 ~~36~~ – that has been shifted by an internal transit time – back through the wall to high-frequency measuring device 12.

On page 8, please amend the first paragraph as follows:

After a certain internal and, therefore, known transit time, a transponder of this type generates a new signal, which it emits via a separate aerial, e.g., in the ISM band, at a frequency of 2.45 GHz. This newly generated signal penetrates the wall again and can be detected by high-frequency receiver 38 ~~24~~ of measuring device 12.

Please amend the paragraph bridging pages 8-9 as follows:

Figure 4 shows an alternative realization of a transponder 240. A sampler is used in this case. The control cycle of the sampler is regulated by a microcontroller 164 such that a maximum voltage occurs at the output of the sampler. ~~Once~~ ~~One~~ this maximum of the output signal has been reached, the microcontroller cycle and the cycle of the measuring device 12 run in synchronicity, although shifted by the transit time of the measurement signal. In this manner it is possible to locate penetration site of the measurement signal and perform a measurement of the wall thickness. Since the signal that controls the sampler is also sent directly, the response from the transponder takes place with minimal delay.

On page 11, line 6, please add equation (4) as follows:

$$t_L = L * c_0 / \sqrt{\epsilon_r}$$

On page 11, in equation (5), please replace “bzw” with – and -- .

After equation (5) please delete the following line as follows:

~~Bzw. – and~~

On page 11, please amend line 18 as follows:

Equations (5) result in equation ~~(6)~~ (3):